

# Centers for Disease Control and Prevention

National Center for Immunization and Respiratory Diseases



## New Respiratory Syncytial Virus (RSV) Vaccines for Adults: General Information and Clinical Guidance

**Current Issues in Immunization Webinar, August 30<sup>th</sup>, 2023**

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In June 2023, CDC's Advisory Committee on Immunization Practices (ACIP) recommended the first two RSV vaccines for older adults.

- RSVPreF<sub>3</sub> (**Arexvy, GSK**) is a 1-dose adjuvanted (ASo1<sub>E</sub>) recombinant prefusion F protein (preF) vaccine.
- RSVpreF (**Abrysvo, Pfizer**) is a 1-dose recombinant preF vaccine.

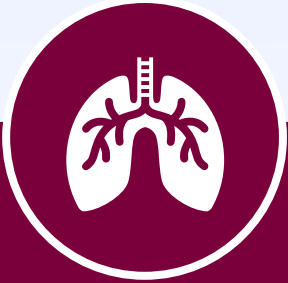
# ACIP recommendation for the use of RSV vaccines in older adults:

Adults aged 60 years and older may receive a **single dose** of RSV vaccine, **using shared clinical decision-making.**

# Respiratory Syncytial Virus (RSV) in Adults



# About Respiratory Syncytial Virus (RSV)



Common  
respiratory virus



Causes mild,  
cold-like  
symptoms



Seasonal  
epidemics



Spread through  
respiratory  
droplets, direct  
contact, fomites

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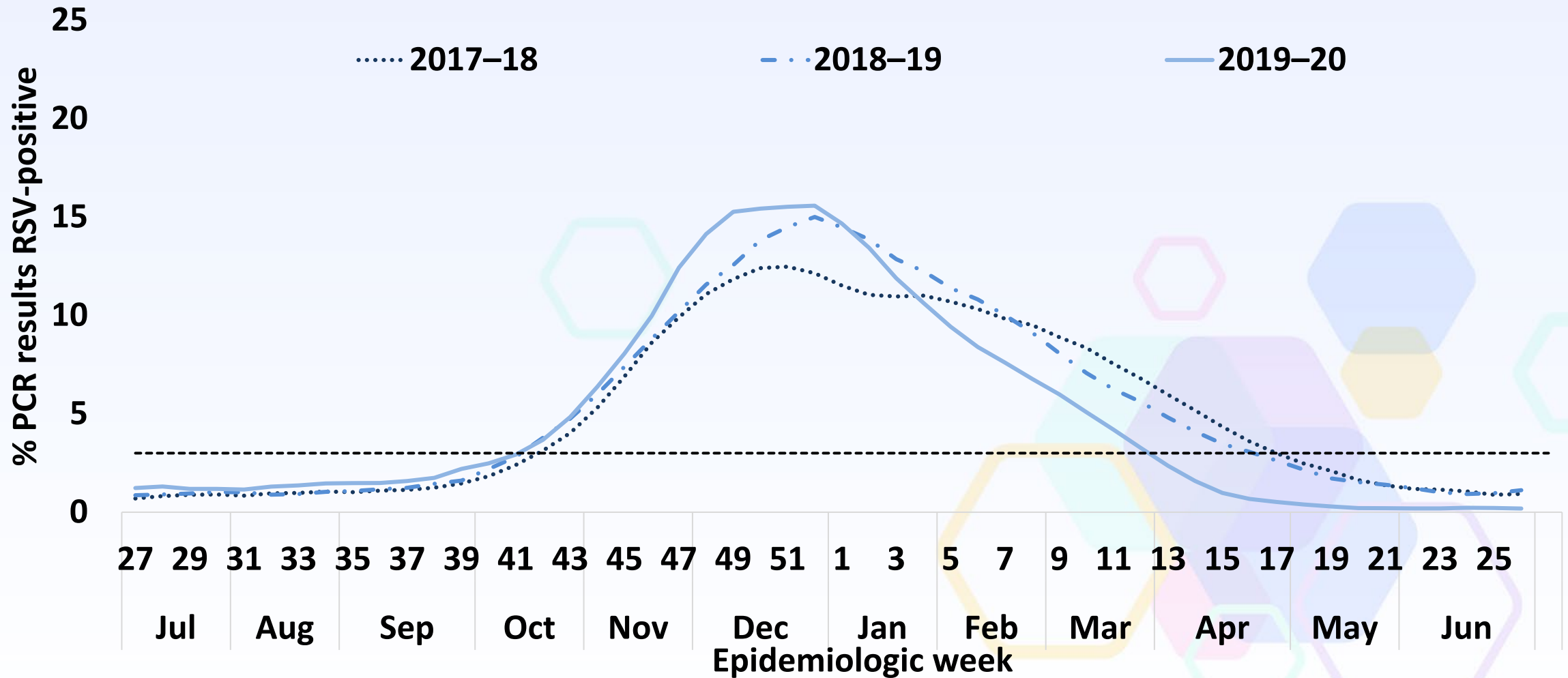


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# Changes in seasonality of RSV transmission following SARS-CoV2 introduction— NREVSS<sup>1</sup>, 2017–2023

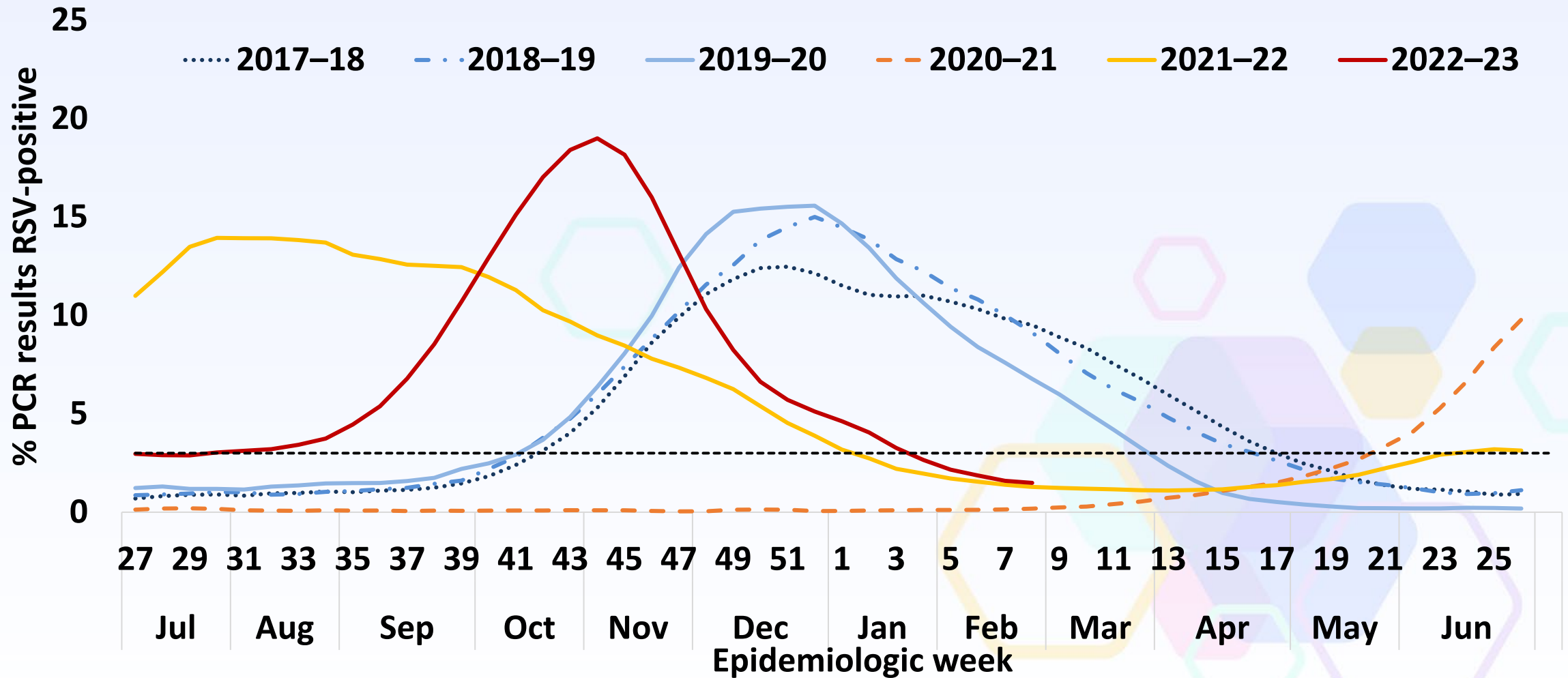


Abbreviation: PCR = polymerase chain reaction; RSV = respiratory syncytial virus.

1. <https://www.cdc.gov/mmwr/volumes/72/wr/mm7214a1.htm>

\* 3-week centered moving averages of percentage of RSV-positive PCR results nationwide. The black dotted line represents the threshold for a seasonal epidemic (3% RSV-positive laboratory PCR results).

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# Clinical Presentation in Adults

- Usually **mild or no symptoms**
- Older adults are at **increased risk** for becoming **seriously ill**
- This includes:
  - Lower respiratory tract infection
  - Exacerbation of existing conditions



# Annual RSV Burden Among Adults Ages 65 Years and Older



**900,000–1,400,000** medical encounters



**60,000–160,000** hospitalizations



**6,000–10,000** deaths



# Chronic Underlying Medical Conditions Associated with Increased Risk of Severe RSV Disease



Lung disease



Neurologic or neuromuscular conditions



Cardiovascular disease



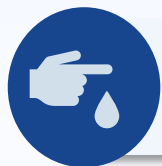
Kidney disorders



Moderate or severe immune compromise



Liver disorders



Diabetes Mellitus



Hematologic disorders



Other conditions that might increase the risk for severe disease

# Underlying medical conditions among adults $\geq 18$ years hospitalized with lab-confirmed RSV: RSV-NET 2014–2018

## Major underlying condition categories

(n=4,970)

N=4,970

%

Major underlying condition categories	N=4,970	%
<b>Cardiovascular disease</b>	<b>2833</b>	<b>57.0</b>
<b>Chronic lung disease</b>	<b>2486</b>	<b>50.0</b>
<b>Diabetes mellitus</b>	<b>1692</b>	<b>34.0</b>
Renal disease	1378	27.7
Immunocompromised condition	1126	22.7
Neurologic disorder	1041	21.0
Chronic metabolic disease (except diabetes)	934	18.8
Liver disease	332	6.7
Blood disorders/ hemoglobinopathy	132	2.7
Other disease or condition	429	8.7

**94%** of hospitalized adults have underlying medical conditions:

- **46%: 1–2 conditions**
- **48%:  $\geq 3$  conditions**

# Other Factors Associated with Increased Risk of Severe RSV Disease



Residence in a nursing home or other long-term care facility (LTCF)



Frailty



Advanced age



# Other Factors Associated with Increased Risk of Severe RSV Disease



Residence in a nursing home or other long-term care facility (LTCF)



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Advanced age

- Residents may have many **other risk factors**
- RSV can cause **serious outbreaks** in LTCFs






# Long-term care facility (LTCF) residents vulnerable to outbreaks and serious illness


- Frequent cause of symptomatic illnesses in LTCF residents
- High attack rate in outbreak settings
  - » **13.5%** over 1 month<sup>1</sup>
- Study of Medicare data estimated RSV-attributable hospitalizations over 6 years<sup>2</sup>
  - 2,909,106 LTCF residents ≥65 years
  - 6,196 cardiorespiratory hospitalizations

<b>Attributable cost</b>	<b>\$51,503,105</b> (\$38,899,971 – \$64,106,240)
<b>Length of stay (LOS)</b>	<b>5.3 days</b> (SE 4.6)
<b>Attributable LOS</b>	<b>32,008 days</b> (95% CI 24,267 – 39,749)

<sup>1</sup>Childs A., et al. BMC Geriatr. 2019 Aug 5; 19(1):210. Funding: Sanofi Pasteur. Caram LB, et al. J Am Geriatr Soc 2009; 57(3): 482-5. <sup>2</sup>Bosco E, et al. JAMA Netw Open. 2021 Jun 1; 4(6): e2111806. Funding: Sanofi Pasteur. Abbreviations: SE: Standard error; CI: Confidence Interval

# Other Factors Associated with Increased Risk of Severe RSV Disease

 Residence in a nursing home or other long-term care facility (LTCF)

 Frailty

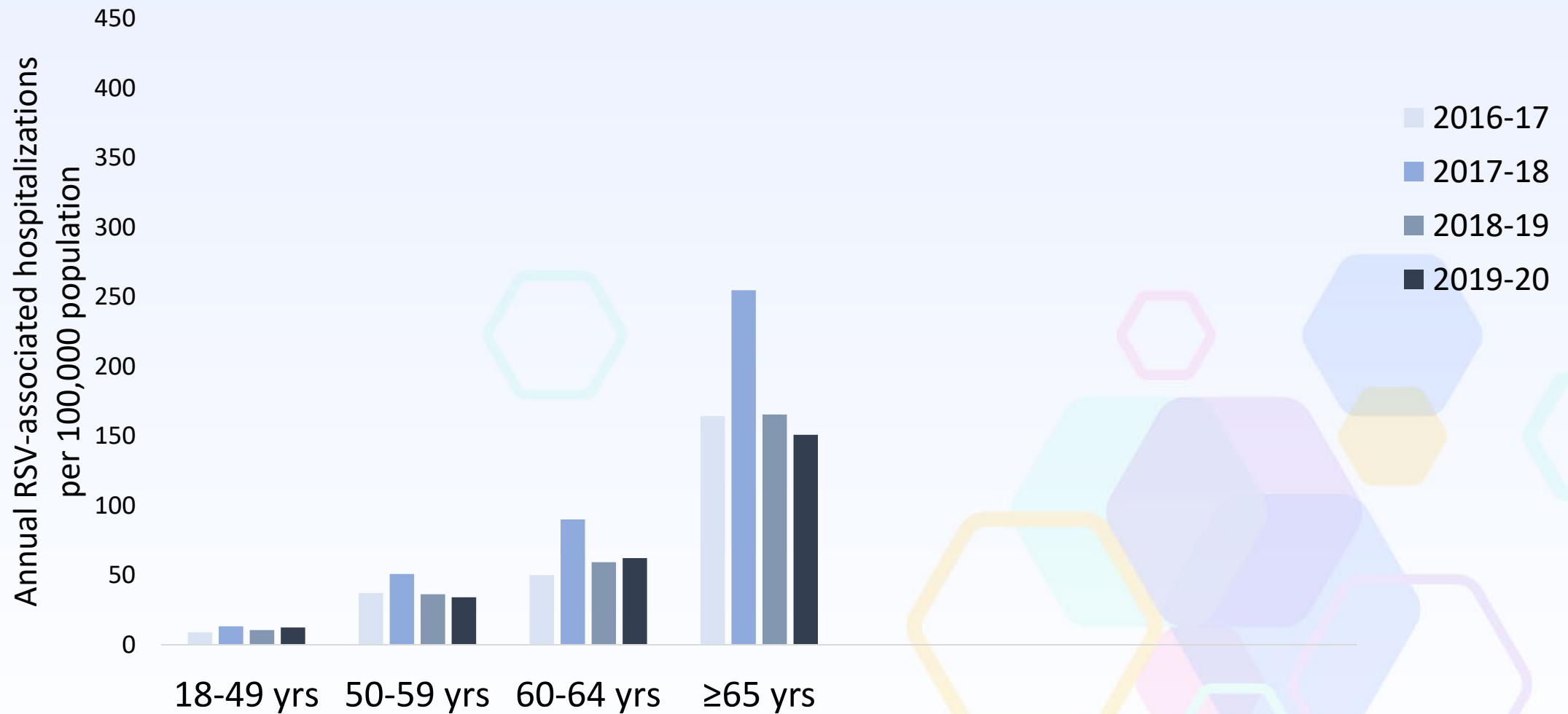
 Advanced age

RSV incidence increases with **advancing age.**

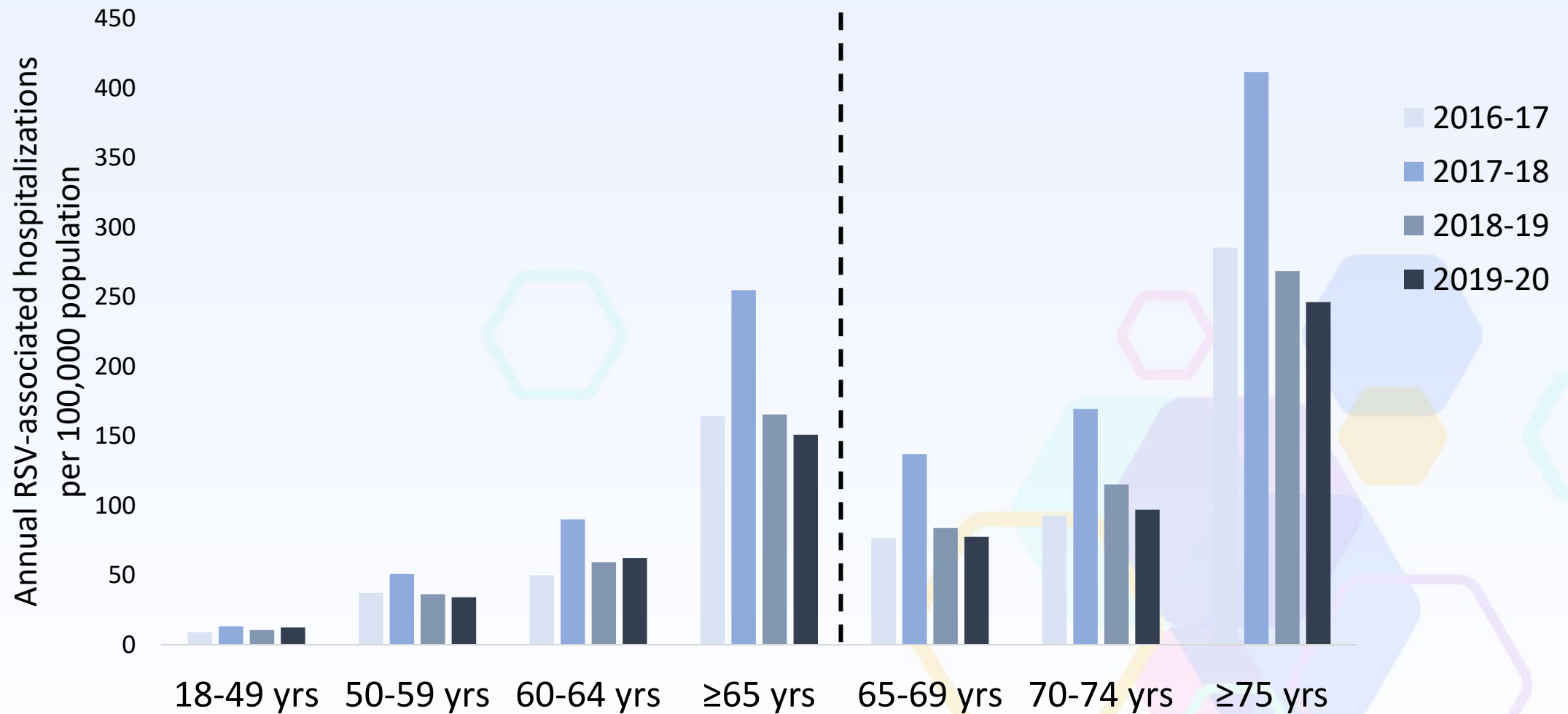




# RSV-NET estimated annual hospitalizations per 100,000 adults: 2016–2017 to 2019–2020



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# RSV Vaccines

Efficacy and safety



# Vaccine Efficacy (VE)

- Vaccines had **similar** and **high** VE against RSV-associated lower respiratory tract disease.
- Case definitions for primary outcomes were **not aligned** across trials.



# Vaccine Efficacy (VE): GSK

- One primary outcome: RSV lower respiratory tract disease (LRTD)
  - At least **two** lower respiratory **symptoms** or **signs**, including at least one **sign**, OR
  - At least **three** lower respiratory **symptoms**

## Symptoms

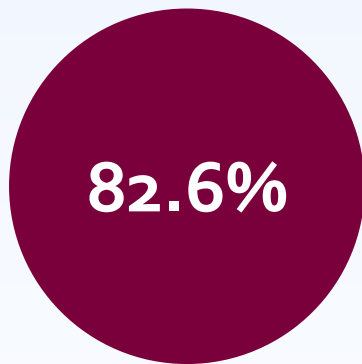
- Sputum
- Cough
- Dyspnea

## Signs

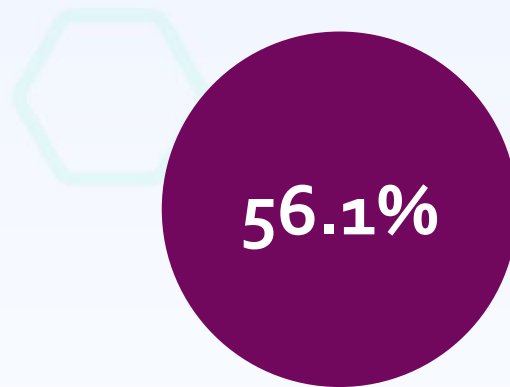
- Wheezing
- Crackles/rhonchi
  - Tachypnea
  - Hypoxemia
- Oxygen supplementation

# Vaccine Efficacy (VE): GSK

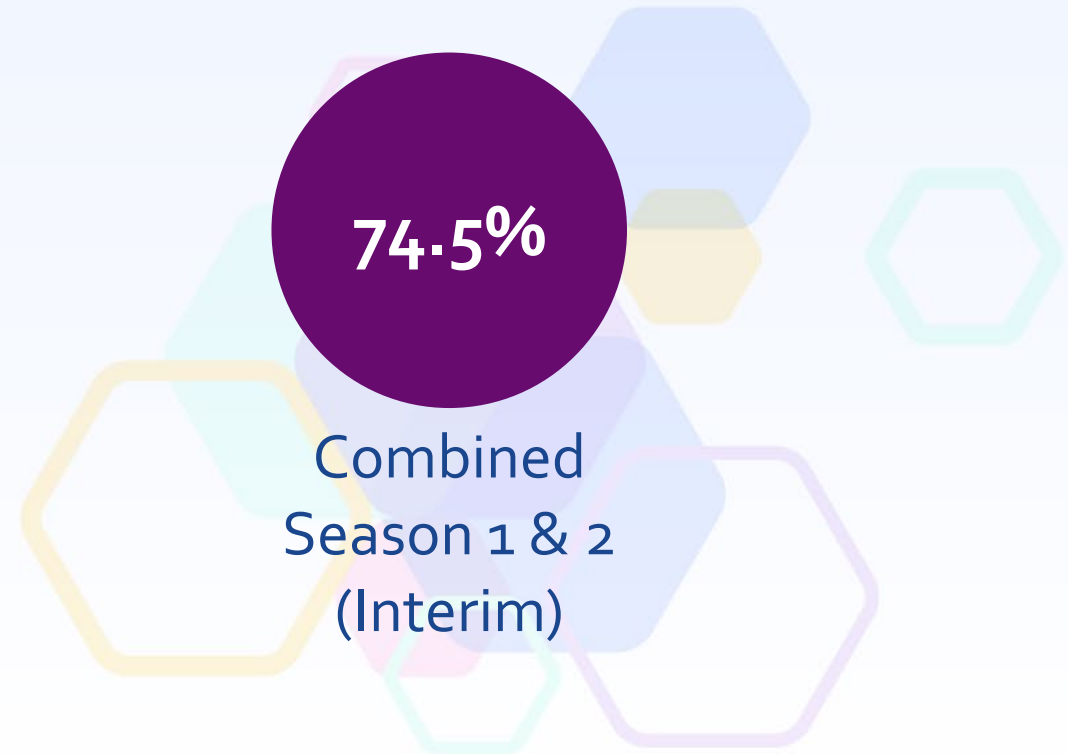
- Randomized, double-blinded, placebo-controlled phase 3 clinical trial
  - 17 countries
  - 24,973 participants
- VE against RSV-associated lower respiratory tract disease (LRTD):



Season 1



Season 2



Combined  
Season 1 & 2  
(Interim)

# Vaccine Efficacy (VE): Pfizer

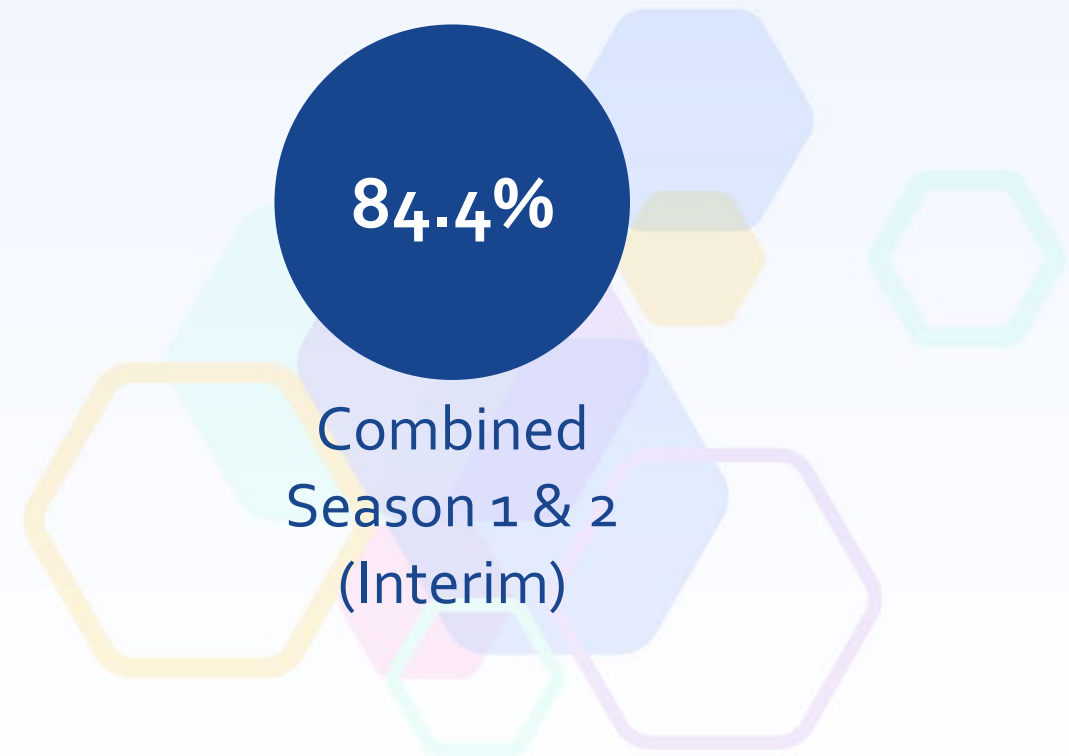
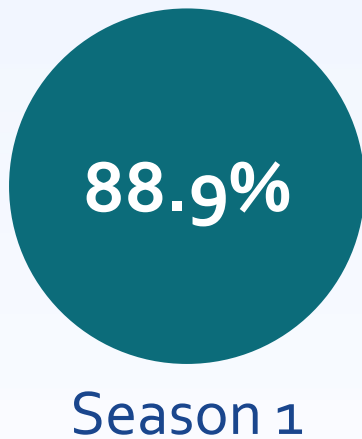
- Two primary outcomes
  - RSV lower respiratory tract illness (LRTI) with at least **two** lower respiratory **signs/symptoms**
  - RSV LRTI with at least **three** lower respiratory **signs/symptoms**

## Signs/symptoms

- Sputum
- Cough
- Shortness of breath
  - Wheezing
  - Tachypnea

# Vaccine Efficacy (VE): Pfizer

- Randomized, double-blinded, placebo-controlled phase 3 clinical trial
  - 7 countries
  - 36,862 participants
- VE against RSV-associated lower respiratory tract disease (LRTD)\*:



\*Based on trial efficacy against RSV LRTI with at least **three** lower respiratory signs/symptoms  
<https://www.cdc.gov/mmwr/volumes/72/wr/mm7229a4.htm>



# Vaccine Efficacy (VE)

- Pfizer's RSVpreF and GSK's adjuvanted RSVPreF3 vaccines both have demonstrated significant efficacy against lower respiratory tract illness caused by RSV among older adults over at least two seasons
  - Trials were underpowered to show efficacy in the oldest adults and in adults who are frail
  - Trials were underpowered to show efficacy against RSV hospitalization
    - Efficacy against symptomatic illness may indicate efficacy against more severe disease
- RSV vaccination has the potential to prevent considerable morbidity from RSV disease among older adults, particularly in those with chronic medical conditions and those who are frail (e.g., long-term care facility residents)

# Vaccine Safety

- Generally **well-tolerated** with an acceptable safety profile
- Most common side effects **are similar to those of other vaccines**



Pain at  
injection site



Fatigue



Headache



Muscle pain



Joint pain

# Vaccine Safety

- Six cases of **inflammatory neurologic events** reported in clinical trials.
- It is **unknown** at this time whether these events occurred by chance, or whether RSV vaccination increases the risk of these events.
- Imbalance in the small number of **atrial fibrillation events**; more cases among vaccine recipients, compared with placebo recipients.



# Vaccine Safety

- CDC will **monitor adverse events** following RSV vaccination through VAERS and the Vaccine Safety Datalink.
- Per FDA requirements, both manufacturers will **conduct further studies**.
- Report any adverse event after RSV vaccination to the **Vaccine Adverse Event Reporting System**.

**VAERS** Vaccine Adverse Event Reporting System  
[www.vaers.hhs.gov](http://www.vaers.hhs.gov)

# Recommendations and Clinical Considerations





# RSV Vaccination Recommendations

- ACIP and CDC recommend that adults ages 60 years and older may receive a **single dose** of RSV vaccine using **shared clinical decision making**.



# Shared clinical decision-making

- There is no **default decision** to vaccinate.
- Recommendations are **individually based** and informed by a decision process between the **health care provider and patient**.



Best available evidence



Patients' risk for disease, characteristics, values, preferences



Clinical discretion



Characteristics of the vaccine

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Neurologic or neuromuscular conditions



Cardiovascular disease



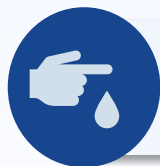
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Other conditions that might increase the risk for severe disease



# Chronic Underlying Medical Conditions Associated with Increased Risk of Severe RSV Disease



Lung disease



Cardiovascular disease



Moderate or severe immune compromise



Diabetes Mellitus

- Many **possible conditions**
- Determining degree of immune compromise is at the **discretion of the treating provider**. Consider:
  - Disease severity
  - Duration
  - Clinical stability
  - Complications
  - Comorbidities
  - Immune-suppressing treatment

# Chronic Medical Conditions Associated with Increased Risk of Severe RSV Disease



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# Other Factors Associated with Increased Risk of Severe RSV Disease



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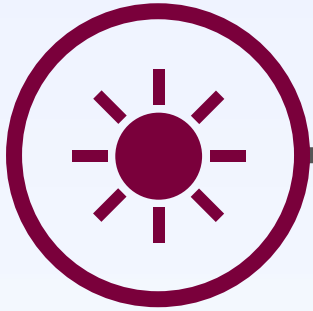
Frailty



Advanced age



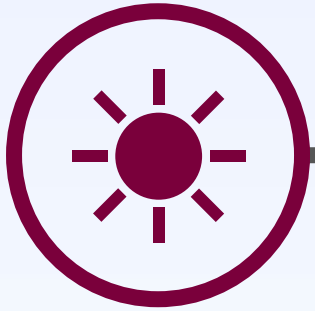
# Vaccination Timing: 2023-2024 Season



## Summer:

Offer RSV  
vaccination as  
early as vaccine  
is available

# Vaccination Timing: 2023-2024 Season



**Summer:**

Offer RSV  
vaccination as  
early as vaccine  
is available



Continue to offer vaccination throughout the RSV  
season to eligible adults who remain unvaccinated

# Data on immunogenicity of coadministration of RSV vaccines with other vaccines

- There are currently limited data available on immunogenicity of coadministration of RSV vaccines and other vaccines.
- **In general, coadministration of RSV and seasonal influenza vaccines met non-inferiority criteria for immunogenicity.\***
- However, RSV and influenza antibody titers were generally somewhat lower with coadministration; the clinical significance of this is unknown.
- Additional studies on immunogenicity of coadministration of RSV with other adult vaccines are in process.

\* Pre-specified non-inferiority criteria for immune responses were met across trials, with the exception of the FluA/Darwin H<sub>3</sub>N<sub>2</sub> strain after simultaneous administration of RSVPreF<sub>3</sub> vaccine (Arexvy by GSK) and adjuvanted quadrivalent inactivated influenza vaccine.

<https://www.cdc.gov/vaccines/acip/meetings/downloads/slides-2023-06-21-23/07-RSV-Adults-Britton-508.pdf>

# Coadministration

- Coadministration with **all** other adult vaccines is **acceptable**.
- If vaccines are NOT administered the same day, **there is no required interval between vaccines**.



# Considerations for Coadministration



Whether the patient is **up to date** with currently recommended vaccines



Likelihood of **returning**



Risk for acquiring **vaccine-preventable disease**



Vaccine **reactogenicity** profiles



Patient **preferences**





# Coadministration Best Practices

- Prepare each injectable vaccine **using a separate syringe**.
- **Label** each syringe.
- Separate injection sites by **1 inch or more**, if possible.
- Administer vaccines that may be more likely to cause a local reaction in **different limbs**, if possible.



# RSV Vaccines

Storage and handling



# RSV Vaccines for Adults Ages 60 Years and Older



RSVPreF3 (Arexvy, GSK)



RSVpreF (Abrysvo, Pfizer, Inc.)

**There is no preferential recommendation; give whichever vaccine is available.**

<https://www.fda.gov/media/167805/download>

<https://www.fda.gov/media/168889/download>

Photo source: GSK and Pfizer, Inc.

# GSK/Arexvy: Storage and Handling

## BEFORE Reconstitution

Store **refrigerated**  
between 2°C and 8°C  
(36°F and 46°F)



Do **NOT** freeze



Protect from **light**



# GSK/Arexvy: Storage and Handling

## BEFORE Reconstitution



Do NOT freeze



Protect from light



## AFTER Reconstitution



Store **refrigerated** between 2°C and 8°C (36°F and 46°F)  
OR at **room temperature** [up to 25°C (77°F)]



Do **NOT** freeze



Protect from **light**



Use within **4 hours**

# Pfizer/Abrysvo: Storage and Handling

## BEFORE Reconstitution

Store **refrigerated** between  
2°C and 8°C (36°F and 46°F)



Do **NOT** freeze



# Pfizer/Abrysvo: Storage and Handling

## BEFORE Reconstitution

Store refrigerated between  
2°C and 8°C (36°F and 46°F)



Do NOT freeze

## AFTER Reconstitution



Store at **room temperature**  
[15°C to 30°C (59°F to 86°F)]



Do **NOT** refrigerate



Do **NOT** freeze



Use within **4 hours**

# Best Practices with Beyond-Use Date (BUD)



Always read the **package insert**.



Label the vial with the **BUD** and your **initials**.



Check the **expiration date** or **BUD** before administering the vaccine.



Discard vials not used before the expiration date or **within the BUD**.



# Summary



# Summary of Key Points

- RSV can cause serious illness in older adults.
- Underlying medical conditions and other factors are associated with increased risk of severe RSV.
- Two RSV vaccines are licensed.
- Adults ages 60 years and older may receive a single dose of RSV vaccine, using shared clinical decision-making.
- Coadministration with RSV and other adult vaccines is acceptable.



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TTY: 1-888-232-6348 [www.cdc.gov](http://www.cdc.gov)

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